

CLAIMS

What is claimed is:

1. A method of removing a key ring stud assembly comprising a key ring portion and
5 a stud, from a threaded aperture of a gas turbine engine component comprising:
forming a tack weld on the key ring portion of the key ring stud assembly;
welding an extractor to the tack weld;
attaching a puller to the extractor welded to the tack weld;
removing the key ring portion by pulling on the puller, wherein the stud remains
10 in the threaded aperture;
assembling two nuts to the stud; and
removing the stud using a tool without damaging the threaded aperture of the gas
turbine engine component.
- 15 2. The method of claim 1, wherein the gas turbine engine component is a turbine rear
frame.
3. The method of claim 1, wherein filler material used in forming the tack weld is the
same material as the component.
- 20 4. The method of claim 1, wherein the extractor comprises a bolt, an elongated
threaded portion fit within the bolt and two legs, wherein ends of the legs are welded to
the tack weld.
- 25 5. The method of claim 1, wherein the puller comprises a rod portion, and the
elongated threaded portion of the extractor fits within the rod portion of the puller.
6. The method of claim 1, wherein the tack weld is a two point tack weld on keys of
the key ring portion.
- 30 7. The method of claim 1, comprising attaching a wrench to a nut secured to the stud
to screw out the stud.

8. A method of removing a key ring stud assembly comprising a key ring portion and a stud, from an aperture of a workpiece comprising:
- 5 forming a tack weld on the key ring portion of the key ring stud assembly;
welding an extractor to the tack weld;
attaching a puller to the extractor welded to the tack weld;
removing the key ring portion by pulling on the puller, wherein the stud remains in the aperture;
assembling two nuts to the stud, wherein a first nut is assembled to the stud and a
10 second nut is secured on the first nut to become fixed and prevent movement of the first nut; and
removing the stud using a wrench without damaging the aperture of the workpiece.
- 15 9. A gas turbine engine component having a key ring stud assembly removed by the method of claim 1.
10. A workpiece having a key ring stud assembly removed by the method of claim 8.
- 20 11. The method of claim 1, wherein welding is conducted using a weld wire.
12. The method of claim 1, further comprising monitoring temperature during the welding.